UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

September 26, 2003

Chuck Clarke, Director
Seattle Public Utilities
710 Second Avenue
Seattle, Washington 98104

Dear Mr Clarke:

Enclosed is Permit 1235, amended, issued to the City of Seattle - Seattle Public Utilities (City) under the authority of Section 10 of the Endangered Species Act (ESA). As the City requested by letter from Cyndy Holtz, received August 26, 2003, Permit 1235 has been amended to authorize take of threatened Puget Sound (PS) chinook associated with trapping and handling adult chinook salmon.

NOAA's National Marine Fisheries Service (NOAA Fisheries) has determined that if City trapping and handling activities are conducted as described in section 4.3.3 of the Cedar River Watershed Habitat Conservation Plan (HCP), and in compliance with the terms and conditions of the Implementing Agreement (IA) and the Permit, the expected take will not appreciably reduce the likelihood of survival or recovery of the PS chinook Evolutionarily Significant Unit (ESU).

The authorization granted by this Permit is subject to full and complete compliance with, and implementation of, the HCP and IA. The City's letter requesting the Permit Amendment also modified the HCP to include Fish Trapping and Handling Guidelines under section 4.3.3 and NOAA Fisheries concurs with this minor modification. While there is no change in the 50-year term of this Permit, the Fish Trapping and Handling Guidelines will be revisited by a fresh section 10 consultation after five years. In order to adaptively manage this manner of take, that reinitiation of consultation will enable an informed decision by NOAA Fisheries and the City whether and how to continue with trapping and handling.

As per the terms of the unlisted species provisions of the IA, should any additional anadromous salmonid species that were unlisted at the time of finalization of the HCP become listed under the ESA, the new species will be added to this Permit according to provisions in section 12 of the IA.

If you do not comply with the terms and conditions of the permit, or if you cannot provide adequate funding for the HCP, the incidental take of PS chinook is not authorized. If you have any questions concerning the Permit, please contact Matt Longenbaugh of the Washington State Habitat Conservation Division, at (360) 753-7761, or matthew.longenbaugh@noaa.gov.

Sincerely,

D. Robert Lohn
Regional Administrator

Enclosure

cc: Tim Romanski, U.S. Fish and Wildlife Service

Endangered Species Act - Section 7 Consultation

Biological Opinion

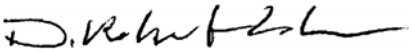
and

Section 10(a)(2)(B) Findings

National Marine Fisheries Service
Permit Amendment for the City of Seattle's
Cedar River Habitat Conservation Plan
King County, Washington

NMFS Tracking No.: 2003/00999

Agency:	National Marine Fisheries Service
Consultation Conducted by:	National Marine Fisheries Service, Northwest Region

Issued by:  Date: September 26, 2003

D. Robert Lohn
Regional Administrator

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1.0 INTRODUCTION

This Biological Opinion (Opinion) under the Endangered Species Act (ESA) section 7, and Findings under ESA section 10, are in response to a request by the City of Seattle to amend their Incidental Take Permit (Permit) Number 1235, to add trapping and handling of adult and sub-adult salmonids at the Landsburg Diversion Dam fish ladder. While the City's Cedar River Watershed Habitat Conservation Plan (HCP) envisioned that fisheries research would occur in association with adult fish passage, details of how the City of Seattle's Public Utility (SPU) would trap and handle were not developed when the HCP was signed and the Permit issued in April 2000. The SPU has recently been asked by researchers at the University of Washington to arrange to collect deoxyribonucleic acid (DNA) and other biological information from immigrating adult salmon at the newly constructed fish ladder at Landsburg, Cedar River Mile 21.8. Trapping and handling of fish was not included in the original Permit, so this consultation provides the biological analysis that supports an amendment to the Permit. The Cedar River is within the Puget Sound (PS) chinook salmon (*Oncorhynchus tshawytscha*) Evolutionarily Significant Unit (ESU).

This Opinion supplements the April 21, 2000, Opinion on issuance of the Permit and is based upon the best scientific and commercial information available. Information is incorporated from: (1) the April 21, 2000 Opinion; (2) the SPU Proposal; and (3) supplementary information detailed below. For this Opinion, the term "City of Seattle" is interchangeable with "SPU."

1.1 Consultation History

From 1994 to 2000, the U.S. Fish and Wildlife Service (FWS) and NOAA's National Marine Fisheries Service (NOAA Fisheries), (together, "the Services") provided technical assistance to the City of Seattle during the HCP development. On April 21, 2000, the Services issued the Permit to the SPU pursuant to section 10(a)(1)(B) of the Endangered Species Act (ESA). Permit issuance decisions were supported by a lengthy process that included disclosure of environmental effects, responses to public comments, analyses of biological effects to ESA-listed species, and coordination with concerned Native American tribes and stakeholders.

The Services cooperated with the City in the preparation of a Draft and Final Environmental Assessment (EA) to satisfy environmental review under the National Environmental Policy Act of 1969 (NEPA). The Services and the City prepared a Final NEPA EA on the HCP (City et al., 1999a) and a 767-page Response to Public Comments on the Public Review Draft of the EA (City et al., 1999b). These two documents were made available to the public on May 27, 1999. The City continues to make available the Response to Public Comment document and related NEPA information at: http://cityofseattle.net/util/CedarRiverHCP/responseindex.htm .

NOAA Fisheries prepared and signed an Opinion under section 7 and Findings under section 10(a)(2)(B) to support the agency's decision to issue a Permit. That document, signed April 21, 2000, is available at: http://www.nwr.noaa.gov/1publcat/bo/2000/cedar_river.pdf . This Opinion takes a fresh look at the environmental baseline and status of the species, as well as presenting a

detailed analysis of biological effects of the proposed trapping and handling. A complete administrative record for this analysis is on file in the NOAA Fisheries Washington State Habitat Branch Office in Lacey, Washington.

1.2 Description of the Proposed Action

1.2.1 Research Objectives

As part of a broader salmon re-colonization study, Dr. Thomas P. Quinn, School of Fisheries, University of Washington, has proposed a joint study with SPU to collect a limited amount of information from adult chinook salmon as they pass through the Landsburg Fish Ladder. Dr. Quinn will be the primary researcher working closely with SPU fisheries biologists. This past spring, the Cedar River Anadromous Fish Committee (AFC) approved the proposal and directed SPU to secure the necessary permits and approvals and proceed with the project. The primary objective of the study is to collect small DNA tissue samples from the fins of all returning chinook as they pass upstream of the Landsburg Dam. Fin clip sampling for DNA acquisition is routine and ubiquitous in Washington State and is generally believed to have little or no impact on returning adult salmon. Using micro-satellite analysis techniques, these samples will be used to establish DNA fingerprints for all females that pass upstream of Landsburg. Deoxyribonucleic acid samples from returns in subsequent generations will be used to determine the maternal origin of each fish passing above Landsburg. These analyses can provide important information on homing specificity in a recolonizing population of salmon. They will also help provide an initial assessment of the productivity of the habitat upstream of Landsburg and the degree to which fish spawning above Landsburg contribute to future spawning populations. Researchers would also like to collect sex, size and scale samples from each fish to establish a baseline demographic profile of the initial recolonizing population. In a separate, but linked study effort, SPU will document chinook redd locations above Landsburg to provide more detailed information on initial recolonization and spawning site fidelity. Researchers believe that this type of information will be useful in assessing the success of SPU's efforts to meet the goals of the HCP with respect to chinook salmon. The information may also contribute useful information to other salmon recolonization efforts in the region.

1.2.2 Fish Trap Description

The fish ladder and sorting facility at the Landsburg Dam was designed and built to pass adult salmonids without trapping or handling. The associated fish sorting facilities are designed to separate sockeye and smaller fish, *i.e.*, coho and chinook sub-adults from adult chinook and large coho. In order to maintain water quality, the HCP proscribes upstream passage of sockeye, which may be present in numbers as great as tens of thousands of returning adults. Upstream passage of relatively small numbers of chinook, coho, and steelhead is believed to not substantially affect the quality of the City's drinking water which is removed at Landsburg. Water quality will be the focus of HCP monitoring to validate expected effects of salmonid passage.

The City will locate a fish trap within the return channel of the newly constructed fish ladder at

Landsburg. Design and construction of the fish trap is done by trained fishery biologists and engineers experienced in fish trapping and represents the latest information and technology to minimize adverse affects to fish. The upstream and downstream walls of the trap will be constructed using wooden panels that slide into slots in the cement walls of the return channel. Each wall will be fitted with a vertical slot to pass flows of 2 to 5 cubic feet per second (cfs) and allow upstream fish passage. The vertical slots will be fitted with guides that allow the insertion of a vertical bar panel to prevent fish from exiting the trap. The walls of the return channel itself will form the sides of the trap. The bottom of the trap is a fabricated aluminum pan (lifting box) which will hold one foot of water depth when the pan is lifted out of the channel for fish sampling.

1.2.3 Fish Trap Operation

All operations of the trap would be done or supervised by trained fishery biologist from either the University of Washington or SPU. Once a fish has entered the trap area between the upstream and downstream wall, the vertical bar panel is placed in the vertical slot of the downstream wall. The lifting box is then raised to just above the water surface in the channel. Perforations in the pan linings will allow water to escape the trap pan until the one foot depth is attained. Since the return channel is 7 feet deep, there will be 2 feet of channel above the sides of the trap pan to contain the fish. An anesthetic will then be added to the pan. As soon as the fish is incapacitated, the trap pan will be lifted an additional 3 feet to gain access to the fish. The fish will remain submerged in the water of the lift box while measuring length, collecting DNA, and scale samples. After sampling, water and anesthetic will be drained out of the trap pan and the fish will be lowered back into the return channel so the pan can refill with river water to one foot in depth. After the fish is fully resuscitated, the trap pan will be lowered to the bottom of the return channel and the vertical bar panel on the upstream trap wall will be opened. The sampled chinook is then free to swim back to the ladder channel and ultimately the fish ladder exit. Each trapped fish will be individually monitored to ensure complete recovery before release.

Smaller, precocious female chinook that pass through the size grader in the sorting channel will be collected during normal sockeye sorting activities with the fish lift facilities. These fish will be placed immediately into a suitably sized anesthetic bath. Fish will be sampled as soon as they become immobile, then placed in an oxygenated recovery container for full recovery prior to release into the fish ladder return channel.

In addition to chinook trapping, the proposed trap can be used to collect wild coho salmon that exceed the size specifications for the vertical bar size grader. Coho will be radio tagged for a study designed to track them to their eventual spawning sites in the upper basin. Large coho caught in the proposed trap will be radio tagged along with smaller coho that will be crowded into the fish lift in the sorting channel. Smaller coho that pass through the size grader and are collected during sockeye sorting can be handled in a manner similar to that described for small chinook above.

1.2.4 Trapping Period

The trap will be deployed when chinook are first expected in the first week in September and removed at the end of February (the end of the coho spawning period). Redd surveys in the Cedar River below Landsburg Dam (1999-2002) indicate that chinook typically begin spawning in the Cedar River in the first week of September with most redds observed between the third week in September and the end of October. The maximum allowable water temperature for trapping is not to exceed 58 degrees Fahrenheit. The maximum holding time for chinook in the large holding pool (trap enclosure) is 24 hours. An individual fish could be in the trap pan for no more than ten minutes.

1.2.5 Contingency Trapping Proposal

In case chinook are hesitant to enter the proposed trap, the contingency is to use a specialized net that will allow capture of individual adult chinook without removal from water. This net would be used after the smaller fish have been crowded through the size specific vertical bar panel. With this alternative, adult chinook will not be allowed to enter the return channel and will remain crowded into the end of the first half of the crowding raceway. The space will be 4 feet in width by 5 feet in depth by 7 feet in length. A custom net will be inserted into one end of the containment area. The cod end of the net will be a soft rubber tube of sufficient size to contain one adult chinook. The net will be moved across and along the bottom of the full length of the containment area. Chinook will have no other option but to move into the net. The net would then be lifted out vertically at the opposite edge of the of the containment area. As the fish is lifted out of the channel, it will be directed by gravity to into the water contained in the rubber cod end of the net. The cod end will allow access to the caudal fin which will be clipped for a DNA sample. No length or scale samples will be taken with this approach and therefore anesthesia is not necessary. As soon as the DNA sample is taken, the fish will be lowered back into the ladder return channel to resume its upstream migration. The fish will remain in water at all times during the sampling and returned to the return channel immediately after the DNA sample is taken. The sampling effort will take less than one minute once the fish has been lifted out of the sorting channel.

1.2.6 Record and Reporting

A daily log will be kept of all sampling activities. Collected data will be analyzed and summarized in an annual report to NOAA Fisheries. Reports of any injured or killed fish will be made to NOAA Fisheries within three days, followed by weekly discussions between SPU and NOAA Fisheries to identify changes in trapping or handling aimed at less injury and mortality.

Condition (11) of the current Permit requires: "Upon locating any dead, injured, or sick individuals of any listed species covered by this Permit, the City shall, within three working days, notify NOAA Fisheries' Washington State Branch Office, Olympia, Washington (360) 753-9530)." Instructions for proper handling and disposition of such specimens will be issued at that time. Care must be taken in handling sick or injured specimens to ensure effective treatment and

care, and in the handling of dead specimens to preserve biological material in the best possible state. This condition does not apply to spawned-out carcasses." This condition will remain unchanged by the proposed Permit amendment.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for this action is limited to the immediate vicinity of the Landsburg fish ladder, RM 21.8. Chinook that become injured by trapping and handling may transit anywhere in the Cedar between the fish ladder and Cedar Falls, RM 34.2.

2.0 BIOLOGICAL OPINION

The ESA of 1973 (16 U.S.C. 1531-1544), as amended, establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the Services to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or to adversely modify or destroy their designated critical habitats.

This document is a product of an intra-agency consultation pursuant to section 7(a)(2) of the ESA and its implementing regulations found at 50 CFR Part 402. The objective of this consultation is to determine whether amending the City's Permit to add salmon trapping and handling is likely to jeopardize the continued existence of PS chinook salmon. Since critical habitat for this ESU was vacated pursuant to a consent decree, this document does not include a critical habitat analysis.

2.1 Evaluating the Proposed Action

The standards for determining jeopardy are set forth in 50 CFR 402 (the interagency consultation regulations). In conducting this analysis, NOAA Fisheries first considers (1) the biological requirements of the listed species, and then (2) evaluates the relevance of the environmental baseline to the species' current status. Subsequently, NOAA Fisheries determines if after the proposed action is complete the species would be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of injury and mortality attributed to: (1) the collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects within the action area. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. If the action is found likely to jeopardize, then NOAA Fisheries would identify reasonable and prudent alternatives for the action.

2.1.1 Biological Requirements

The first step in the ESA section 7(a)(2) analysis is to define the species' biological requirements and identify those that are most relevant to each consultation. Relevant biological requirements are those conditions necessary for the PS chinook salmon ESU to survive and recover to naturally reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity and spatial distribution of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining numbers in the natural environment (McElhany et al. 2000). The biological requirements of chinook salmon include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), abundant clean spawning substrates, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence *et al.* 1996). The biological requirements of PS chinook that are likely to be affected by the project are access to spawning habitats.

2.1.2 Environmental Baseline

The environmental baseline represents the current set of conditions to which the effects of the proposed action are then added. Environmental baseline is defined as "the past and present impacts of all Federal, state, and private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or informal section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process" (50 CFR 402.02).

The life history characteristics (*e.g.*, migration timing) of Cedar River chinook are an expression of genetics and also adaptation to the local environment of the basin. Cedar River chinook salmon have evolved in a basin with high quality, relatively sediment-free, cool water and a complex pathway from the lower river to the ocean. For the past 22 or so generations, Cedar chinook have been forced to migrate to and from Puget Sound through the Lake Washington system and Ship Canal instead of their natural route through the Black and Duwamish rivers to Elliott Bay. During the past century, conditions in Lake Washington have been greatly altered as the lake level was lowered by about 10 feet, shallow shorelines with extensive riparian vegetation have been replaced with mostly bulkheads, little riparian vegetation and many piers. Water quality in the lake was gradually degraded with sewage and industrial waste until most discharges were contained and treated starting in the 1970s.

The headwaters of the Cedar River, which originate in the Cascade mountains, contribute high quality water to the original anadromous zone located below Cedar Falls at about RM 34. The river drains a watershed of approximately 184 mi² to the confluence with Lake Washington. Anadromous fish transit some 19 miles of the Lake Washington system before entering east-central Puget Sound at Shilshole Bay.

2.1.3 Status of the Species

NOAA Fisheries considers the current status of the listed species taking into account population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list PS chinook salmon for ESA protection and also considers new data that are relevant to the determination.

NOAA Fisheries completed a status review of chinook salmon from Washington, Idaho, Oregon, and California in 1998, which identified fifteen distinct species (ESUs) of chinook salmon in the region (Myers *et al.* 1998). After assessing information concerning chinook salmon abundance, distribution, population trends, risks, and protection efforts, NOAA Fisheries determined that chinook salmon in the PS ESU are at risk of becoming endangered in the foreseeable future. Subsequently, NOAA Fisheries listed PS chinook salmon as threatened (March 1999, 64 FR 14308). This listing extends to all naturally spawning chinook salmon populations residing below natural barriers (e.g., long-standing, natural waterfalls) in the PS region from the North Fork Nooksack River to the Elwha River on the Olympic Peninsula, inclusive.

The PS ESU is a complex of many individual populations of naturally spawning chinook salmon, and 36 hatchery populations (March 1999, 64 FR 14308). Recently, the Puget Sound Technical Recovery Team (PSTRT), an independent scientific body convened by NOAA Fisheries to develop technical delisting criteria and guidance for salmon delisting in Puget Sound, identified 22 geographically distinct populations of chinook salmon in the PS ESU, including one in the Cedar River (PSTRT 2001, 2002; BRT 2003). These population designations are preliminary and may be revised based on additional information or findings of the PSTRT.

In most streams within Puget Sound, both short- and long-term trends in chinook salmon abundance are declining. Overall abundance of chinook salmon in this ESU has declined substantially from historical levels and many populations are small enough that genetic and demographic risks are high. An updated assessment of the status of the ESU indicates that about half of the populations are declining and half are increasing in abundance based on long-term trends in abundance and median population growth rates (BRT 2003). The conclusion of the BRT after the updated assessment was that this ESU remains likely to become endangered. The BRT were particularly concerned that the concentration of the majority of natural production occurs in just two basins, hatchery production has been very high, and widespread losses of estuarine and lower floodplain habitat diversity have occurred within the ESU (BRT 2003). Most populations are relatively small and recent abundance within the ESU is only a small fraction of estimated historic run size.

Genetic diversity and fitness of naturally spawning populations may be severely reduced through the widespread influence of hatchery populations. Harvest impacts on PS chinook salmon stocks have been quite high in the past. Harvest rates for the ESU averaged 44% based on the latest data available (BRT 2003). Migratory blockages and degradation of freshwater and estuarine habitat have contributed to reduced abundances in this ESU. Widespread agriculture, urbanization, and forest harvest have significantly altered the complexity of freshwater and estuarine habitats used

by chinook salmon. Diking, dredging, and other forms of hydro-modification have diminished the amount of side-channel and slough habitat available for rearing and spawning.

2.1.4 Status of the Species in the Action Area

Recently, the PSTRT delineated one independent population of chinook salmon within the Cedar River (2001). The recent biological review team draft update (BRT 2003) reported on several elements of the Cedar River chinook population: (1) the geometric mean of natural spawners for the years 1998 through 2002 is 400 (estimated escapements ranging from 150 to 810); (2) while most of the chinook in the Lake Washington system are hatchery fish from the Issaquah Hatchery, there are no chinook hatcheries on the Cedar River and therefore hatchery interactions are considered minor; (3) the short- and long-term trends in natural spawners for 1997 through 2001 all show the population growth rate is slightly less than necessary for replacement, which indicates that substantial improvements are needed in population viability parameters; and (4) fishing harvest rates for 1997 through 2001 have been reduced to 31%, compared to the previous estimate of 52% from about 1969 to 1974.

Likely limiting factors for the Cedar River chinook population that are detailed in the NEPA documents for the HCP are summarized below. Changes in Lake Washington basin drainage patterns that have forced juvenile chinook to emigrate through a large lake into a small, relatively deep estuary (Shilshole Bay) instead of their natural path into a large estuary, *i.e*, the lower Duwamish which formerly covered several thousand acres of saltmarsh and intertidal mudflats favored by juvenile chinook. Land management practices in the Cedar River basin include Landsburg Diversion Dam and pipeline, which has blocked all upstream fish passage since the early 1900s. Development along the lower Cedar River, including diking, channelization, and dredging for flood control as well as loss of forest cover and increased impervious area has affected water quality and the availability of high-quality habitat. This confinement of the river, in turn, has led to excessive bedload movement, scour of chinook redds, and has likely removed rearing habitats. Streamflows that are too low or too high can have great effects on a particular year-class of fish, depending on time of year, duration, and magnitude. Predation is considered a large reason for mortality in both the Cedar River and Lake Washington. Operation of fish passage facilities at the Ship Canal has also been a likely influence on chinook production some years (Jones & Stokes, 2001).

2.1.5 Relevance of the Environmental Baseline to the Species' Current Status

Across the ESU, a combination of habitat, harvest, and hatchery effects that vary for each watershed in the ESU have been identified as factors for decline. As described above, current conditions in the ESU, the Lake Washington basin, the Cedar River, and the action area do not provide life requisites for chinook. In the Lake Washington basin, the WRIA 8 Limiting Factors report is insightful (Kerwin 2001).

2.2 Effects of the Proposed Action

NOAA Fisheries considers the impact in terms of the number of PS chinook salmon that will be killed or injured during a particular life stage and gauge the effects on the population size and viability.

In this analysis, the probable direct and indirect effects of the action on the chinook salmon are identified. The ESA implementing regulations direct NOAA Fisheries to do so "together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02)." Direct effects include those occurring at the project site and can extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects are those effects that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Indirect effects can occur throughout the action area, and are used to help define the extent of the action area.

2.2.1 Fish Passage

The proposed action would occur at the newly constructed adult fish ladder designed to pass several species of anadromous fish, *i.e.*, chinook, coho, steelhead, and cutthroat, but not sockeye. Trapping and handling each chinook would not appreciably delay passage of other fish, since most of the coho and all of the steelhead would immigrate at other seasons than chinook. For chinook, the few minutes necessary to trap and handle each fish would not substantially delay their upstream passage.

2.2.2 Short-term Effects

Potential short-term effects are handling stress suffered by each chinook. Because each chinook would be individually handled in ambient cool water for no more less than 10 minutes, always kept in water, and promptly released into the river water at the ladder, handling stress would be minimized. All operations would be overseen by a trained fishery biologist.

There would be no new habitat effects in addition to those involved in construction and operation of the fish ladder, which has already been reviewed under section 7 consultation as part of the HCP and the related Army Corps of Engineers (COE) permit. Water quality in the Cedar River would not be affected by the trapping and handling. Any water containing anesthetic would be treated before discharge to the Cedar River.

2.2.3 Trapping and Handling

Trapping and handling will occur only according to guidelines described in section 4.3.3 of the HCP (as modified by the SPU letter received August 26, 2003), summarized above in section 1.2, and occurring only at the Landsburg fish ladder. Full control of the environmental conditions under which trapping and handling occur will ensure that handling stress is minimized.

Nevertheless, any time that fish are handled, there are general risks to fish. Depending on the duration, temperature and potential for fish to be roughly handled, handling can elicit stress responses in fish, which can lead to reduced disease resistance, reduced capacity for activity, increased oxygen consumption, decreased reproductive capacity, and death (Kelsch and Shields 1996). The proposed procedures minimize the duration and number of times fish are handled, but the cumulative effects of trapping and handling may result in sub-lethal injury to some fish.

Some fish may be injured through handling, and some fish could die as a result of cumulative stressors (Wedemeyer et al. 1990). Given that the trapping would occur in a controlled environment and cool water temperatures, fish would likely not be subjected to increased oxygen consumption or metabolic demand, which have been generally associated with handling stress and increased potential for injury or death (Clements et al. 2002; Kelsch and Shields 1996). Fish handlers supervised by SPU will work quickly to process each fish and expedite the return of fish to the river. While delayed death could occur after an otherwise seemingly healthy fish has been released, it would be difficult to detect the number of fish that are killed from this effect. Other related research to survey salmon spawning areas may encounter chinook that die before spawning. Each pre-spawning mortality will be located, dated, measured, and reported to NOAA Fisheries.

2.2.4 Long-term Effects

The only foreseeable long-term effects are better information about the Cedar chinook population. As described above in section 1.2.1, demographic information from salmon that recolonize the Cedar River can assist fishery managers to build up the Cedar chinook population, as well as perhaps enhance other efforts at recolonization in this and other ESUs.

2.2.5 Incidental Harvest or Trapping

Adult chinook salmon returning to the Cedar River are not targeted for trapping or commercial harvest after entering the Lake Washington basin. There may be an incidental catch of small numbers of chinook in the Lake Washington sockeye fishery. Habitat conditions in the Lake Washington and Cedar basins that may be inimical to salmon have been identified and many items are gradually being addressed (Kerwin 2001). Collection of demographic information by trapping and handling chinook at Landsburg is not expected to appreciably slow the upstream passage of migrating Cedar chinook.

2.2.6 Cumulative Effects

Cumulative effects are defined as those effects of future state, tribal, local or private actions that are reasonably certain to occur within the action area considered in this Opinion (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Other actions expected to occur at the fish ladder include minor maintenance of the fish ladder or juvenile fish screens, or other operations associated with City water diversions at Landsburg. None of these actions are anticipated to have an adverse effect on chinook, although the fish ladder and screens are newly constructed and may require now-unknown operational adjustments in the first few years.

All the watershed upstream of the fish ladder is owned by the City. The SPU has committed to manage these lands according to the Cedar HCP, which addresses roads, riparian areas, ramping flows, and potential in-river restoration. Any adverse effects of SPU operations on PS chinook in the action area would be minor and any "take" is covered by the Permit. While the river habitats above Landsburg are now considered generally high quality for salmoinds, over the 50 years of the HCP conditions will steadily improve for riparian and channel functions.

2.3 Conclusion

After reviewing the current status of threatened PS chinook salmon, and evaluating effects from the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NOAA Fisheries' biological opinion that amending Seattle's Permit to add trapping and handling is not likely to jeopardize the continued existence of the PS chinook salmon ESU.

2.4 Reinitiation of Consultation

Consultation must be reinitiated if the amount of take specified in the Incidental Take Statement (ITS) is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). If minimization measures described as part of the project and in this Opinion are not followed, then this would constitute new information that could affect the listed species in a way not previously considered, and may require NOAA Fisheries to reinitiate consultation.

In order to adaptively manage take from trapping and handling, reinitiation is prudent after five years of trapping and handling chinook at Landsburg. The uncertain, possibly much greater numbers of chinook returning to the Cedar River after five years are another reason to revisit the consultation at that time. By that time, much will have been learned about specific risks to chinook from trapping and handling at Landsburg. The complete history of any injured or killed fish, along with the SPU Fish Trapping and Handling Guidelines, section 4.3.3 of the HCP (as modified by SPU's letter received August 26, 2003) will be reviewed with SPU staff at that time.

2.5 Incidental Take Statement

Section 9 of the ESA and Federal regulation pursuant to section 4 (d) of the Act prohibit the take of endangered and threatened species without special exemption. "Take" is defined as to harass,

harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined as significant habitat modification or degradation that results in death or injury to listed species by "significantly impairing behavioral patterns such as breeding, spawning, rearing, migrating, feeding, and sheltering" (50 CFR 222.102). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant/grantee carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action is not considered prohibited taking, provided that such takings is in compliance with the terms and conditions of this ITS.

An ITS specifies the effects of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize take and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.5.1 Amount or Extent of Anticipated Take

Take from trapping and handling will be incidental to operations of the fish ladder at Landsburg. Approximately 20 adult PS chinook salmon are expected to be trapped and handled each year for the next 5 years. In future years (5-15 years from now), SPU does not expect any more than 100 chinook to be handled at the facility. However, if current recovery efforts are successful, these numbers could be exceeded in some years. The SPU Permit, issued in 2000, authorizes incidental take for 50 years.

Injury and mortality rates from SPU trapping and handling are expected to be extremely low to none. Research by SPU staff have identified mortality rates that rarely exceed 2% for other agencies' and tribal trap and haul operations handling hundreds to thousands of fish. The SPU staff believe that the susceptibility to stress and injury from the proposed sampling operations will be much lower than a typical trap and haul operation because: (1) trained biologists will oversee all operations; (2) handling time will be much lower, (3) water temperature in the trap will not have time to increase;(4) sampled fish will be processed one at a time; and, (5) fish will not be transported by truck. Over all of the next 5 years, cumulative injury and death may occur for an estimated one fish out of 100 trapped.

2.5.2 Reasonable and Prudent Measures

The reasonable and prudent measures described below are necessary and appropriate to minimize amount of incidental take of PS chinook salmon resulting from this proposed action. These measures are non-discretionary and must be binding conditions of the handling guidelines in order for the exemption in section 7(a)(2) to apply. The SPU has the continuing duty to follow the HCP activities covered in their Permit Number 1235. If the SPU fails to ensure compliance with these terms and conditions, the protective coverage of ESA section 7(o)(2) and section 10(a)(1)(B) may lapse.

1. The SPU shall minimize take during trapping and handling.

2. The SPU shall report numbers and conditions of trapped and released chinook salmon.

2.5.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the SPU must comply with the following terms and conditions which implements the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure (1), the SPU will ensure that:

   Chinook salmon will be handled by trained biologists with extreme care, and all handling will be minimized to maximum extent possible. The City shall follow the Guidelines for Trapping and Handling described in their letter, received August 25, 2003, and summarized above in section 1.2 of this Opinion.

2 To implement Reasonable and Prudent Measure (2), the SPU will ensure that:

   A report is prepared containing numbers and metrics of chinook salmon handled, and any pre-spawning mortality observed. The report shall be submitted to NOAA Fisheries within 12 months of the end of trapping. Before the report is prepared, the SPU shall report to NOAA Fisheries within three days any instances of injury or death from trapping and handling, per condition (11) of Permit Number 1235. Further, during the period of trapping, the SPU shall consult weekly with NOAA Fisheries to remedy any further instances of injury or death from trapping and handling. This condition does not refer to spawned-out fish.

3.0 SECTION 10(a)(2)(B) FINDINGS

A. Permit Issuance Considerations

In order to issue an Permit under 50 CFR section 222.222(1), NOAA Fisheries must consider the following:

1. The status of the affected species or stocks. The status of anadromous salmonids potentially affected by the HCP has been considered above (see section 2.1.3 of the Opinion). The environmental baseline for anadromous fish and their habitats (section 2.1.2) was also considered.

2. The potential severity of direct, indirect and cumulative impacts on anadromous salmonids and their habitats as a result of the proposed activity. The effects of the

proposed action were examined in detail in this analysis (see section 2.2 of the Biological Opinion).

3. The availability of effective monitoring techniques. Monitoring of the implementation of the HCP and the effectiveness of the HCP prescriptions are a critical feature of this HCP. Monitoring reports will be completed and submitted to NOAA Fisheries according to the schedule described in section 4.5 of the HCP, and Term and Condition 2 described above in the Opinion.

4. The use of the best available technology for minimizing or mitigating impacts. The fish trapping and handling guidelines proposed by SPU represent the latest direction in technology for minimizing impacts on salmon.

5. The views of the public, scientists and other interested parties knowledgeable of the species or stocks or other matters related to the application. As the City has been implementing the HCP, the City has convened panels of scientists and stakeholders to help develop research proposals and guide many aspects of implementation. The Cedar River Anadromous Fish Committee (CRAFC) continues to play a key role in assisting the City and providing a forum for representatives of interested groups to discuss scientific and social issues of anadromous fish posed by HCP implementation. The City provides public access to CRAFC information at: http://cityofseattle.net/util/CedarRiverHCP/afc.htm.

B. Permit Issuance Findings

Having considered the above, the NOAA Fisheries makes the following findings with regard to the adequacy of the HCP meeting the statutory and regulatory requirements for a Permit under section 10(a)(2)(B) of the ESA and 50 CFR 222.22(c)(2):

1. The taking of listed species will be incidental to SPU operations. The NOAA Fisheries anticipates that the proposed action would likely result in incidental take of threatened PS chinook, and other currently unlisted species of anadromous salmonids, if they were listed. This take would be limited to an estimated take of 20 PS chinook annually. Cumulative injury and mortality for the next 5 years is estimated at no more than one out of 100 trapped fish.

2. The City of Seattle, acting through the SPU will, to the maximum extent practicable, monitor, minimize and mitigate the impacts of taking anadromous salmonids associated with trapping and handling of adult and sub-adult salmon at the Landsburg fish ladder. The Fish Handling and Trapping Guidelines, described in section 4.3.3 of the HCP (as modified by SPU's letter received August 26, 2003), provide specific conservation measures to monitor and minimize the impact of take of PS chinook under the Permit.

3. Based upon the best available scientific information, the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild. Conservation

measures identified in the HCP will increase the quality and quantity of spawning and rearing habitat and result in a benefit to anadromous salmonid species. The Act's legislative history establishes the intent of Congress that this issuance criteria be based on a finding of "not likely to jeopardize" under section 7(a)(2) (see 50 CFR 402.02). This is the identical standard to section 10(a)(2)(B). The conclusions regarding jeopardy for the listed ESU are found in section 2.3 in the Opinion above. In summary, NOAA Fisheries has considered the status of the species, the effects of the environmental baseline, the effects of the proposed action, and cumulative effects, to conclude that amendment of the Permit for trapping and handling would likely not jeopardize the continued existence of PS chinook.

4. The plan has been revised to assure that other measures, as required by NOAA Fisheries, has been met.

5. NOAA Fisheries has received the necessary assurance that the plan will be funded and implemented. Signing of the Implementation Agreement (IA) by the City assures that the HCP will be implemented. Also, the HCP and IA commit the City to adequately fund implementation of the HCP.

C. Conclusion

Based on these findings, it is determined that the City's proposal to amend the Permit meets the statutory and regulatory requirements for an Incidental Take Permit under section 10(a)(2)(B) of the ESA and 50 CFR 222.307.

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